Alternate Power Source

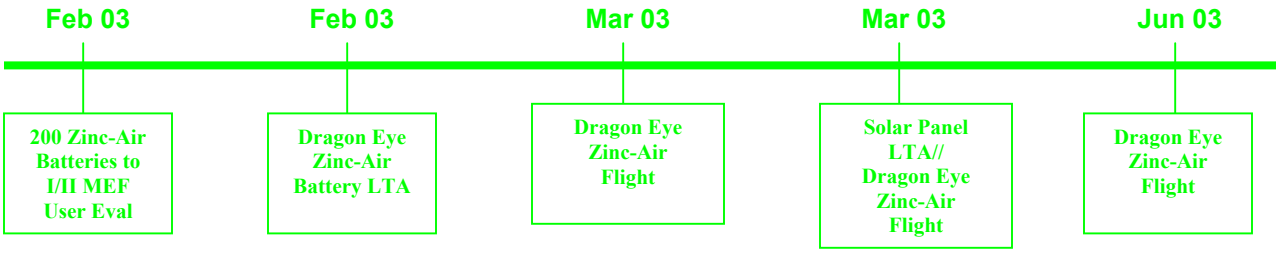
Purpose: Develop an alternate power source for the family of man-packable tactical radios used by Marine operating forces.

Background: The single greatest limiting factor in the mobility and field operating time for reconnaissance units is the weight and service life of current power sources for radios and Reconnaissance, Surveillance, and Target Acquisition technologies. Alternatives are needed that are lightweight, quiet and affordable. The objective is to reduce the Marine's combat load and battery requirement by developing a power source that is lighter than and yields or exceeds the power densities of the current battery technology (BA-5590). This initiative supports the Alternate Power Mission Need Statement.

Description: Zinc-air batteries use oxygen from the atmosphere to react electrochemically with alkaline zinc anodes similar to those found in alkaline batteries (e.g. Duracell, Energizer), making them very lightweight, safe, and low cost. The air is drawn into the battery case and circulated through it via a small direct current fan powered by the battery, so that full power is achieved even when the battery is packed into a rucksack. Since the zinc-air battery is larger than a BA-5590 battery, there is an electrical interface the size of the BA-5590, which fits into the battery compartment of the radio-transmitter, and this is connected to the zinc-air battery via a retractile cord. Connection of the cord to the zinc-air battery energizes the fan. The model FC zinc-air battery weighs 5.5 lbs, versus 2.2 lbs. for the BA-5590, but delivers the equivalent capacity of 6 BA-5590's, powering an AN/PRC-119B or AN/PRC-119F for six to nine days depending on usage. Once in production it will deliver electrical power at a cost of about 15-20 cents per watt-hour, versus 42 cents per watt-hour for the BA-5590. The Marine Corps Warfighting Laboratory in conjunction with the Army's CECOM's Fuel Cell Technology Team, Fort Monmouth, NJ, will evaluate the Zinc-Air fuel cells, assess and document fuel cell performance (technological maturity, size, weight, and cost) in comparison to current SINCGARS battery and other candidate power source technologies, and deliver a prototype fuel cell power source for field experimentation.

Deliverable Product(s): Prototype Zinc-Air fuel cell power source and assessment that shows advantages over current SINCGARS battery technology in size, weight, and cost.

Milestones:



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